

COMPARING PERITONEAL ACCESS METHODS AND ASSOCIATED MORBIDITY DURING VENTRAL HERNIA REPAIRS

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Introduction

We aimed to evaluate the rates of peritoneal access-related injuries during minimally invasive ventral hernia repair (MIS-VHR).

There is no clear consensus as to the optimal method of initial entry into the peritoneal cavity to prevent these low rate catastrophic complications.

Methods

We performed a retrospective review of the prospectively collected Americas Hernia Society Quality Collaborative (AHSQC) database comparing veress, optical trocar, and open cut down peritoneal access for MIS-VHR from 2014 to 2018.

Primary outcome measure was peritoneal access related injury. Secondary outcomes measures included any intraoperative complication, 30 day surgical site infections (SSI), or 30 day surgical site occurrences (SSO).

We controlled for number of prior hernia surgeries, prior mesh placement, history of component separation, and hernia size using multivariable logistic regression.

Results

There were 6731 patients in our final analysis with veress (34%), optical trocar (54%), and open cut down (12%) access.

Three access related injuries occurred in our sample, resulting in a rate of 0.4 injuries per 1000 operations. All injuries involved the liver and occurred with veress (2) and optical trocar (1).

There was no difference in rates of intraoperative complications between veress (0.66%), optical trocar (1.09%), or open cut down (0.62%, $p=0.158$).

No difference in access related injuries, intraoperative complications, SSI, or SSO was seen between robotic and laparoscopic cases.

Figure 1a: 30 Day SSO Rates by Access Type

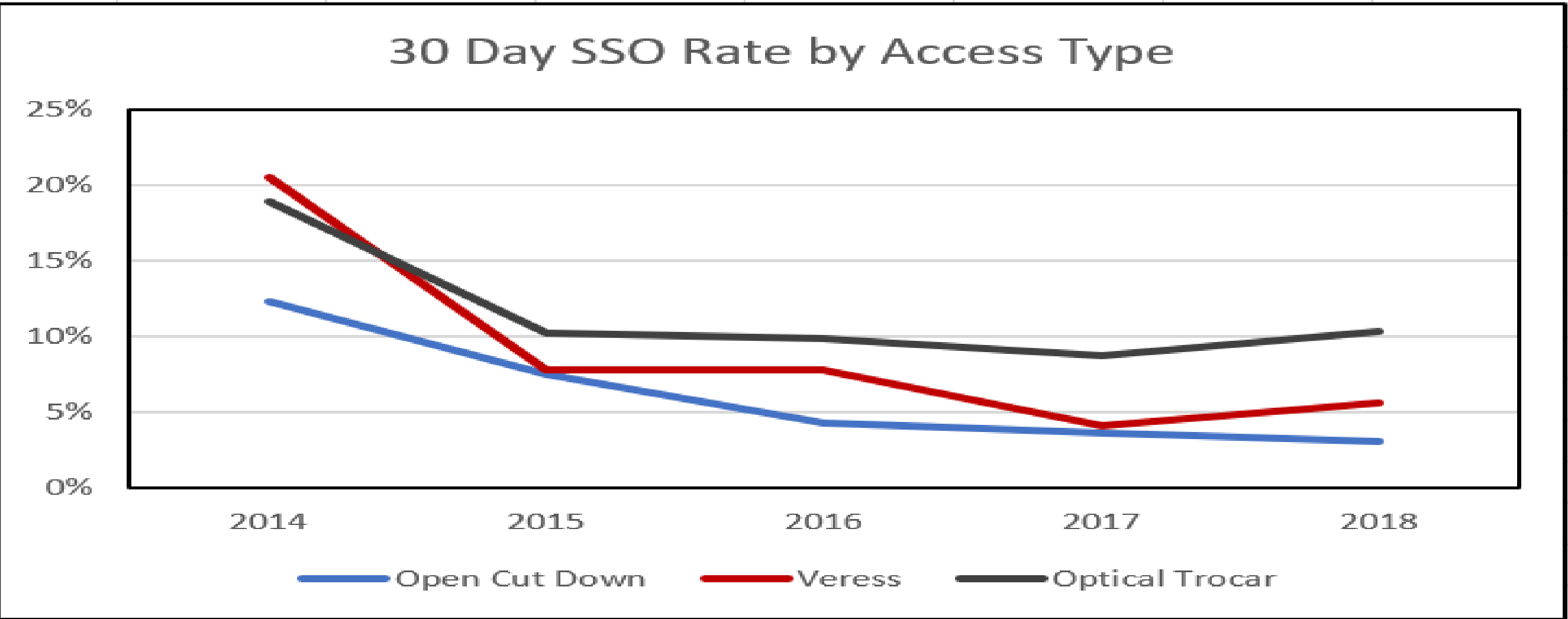


Figure 1b: 30 Day SSO by MIS-VHR Approach

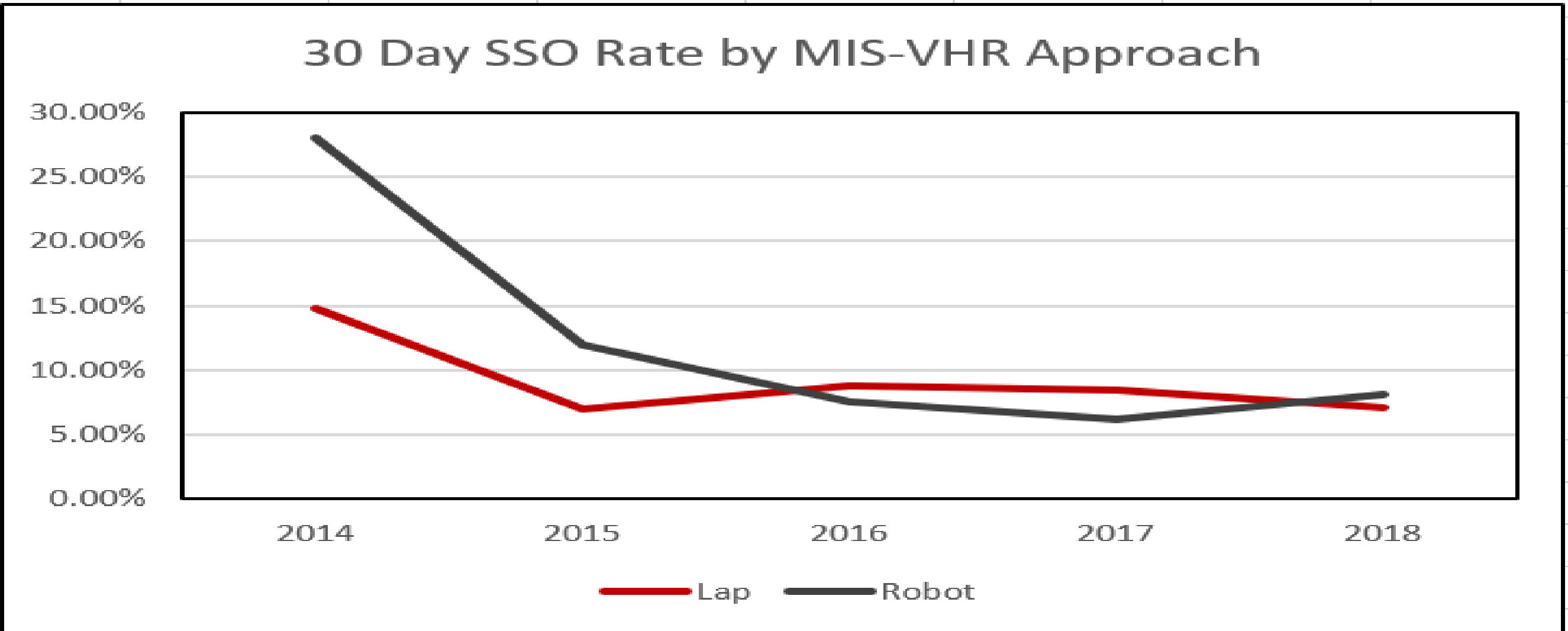
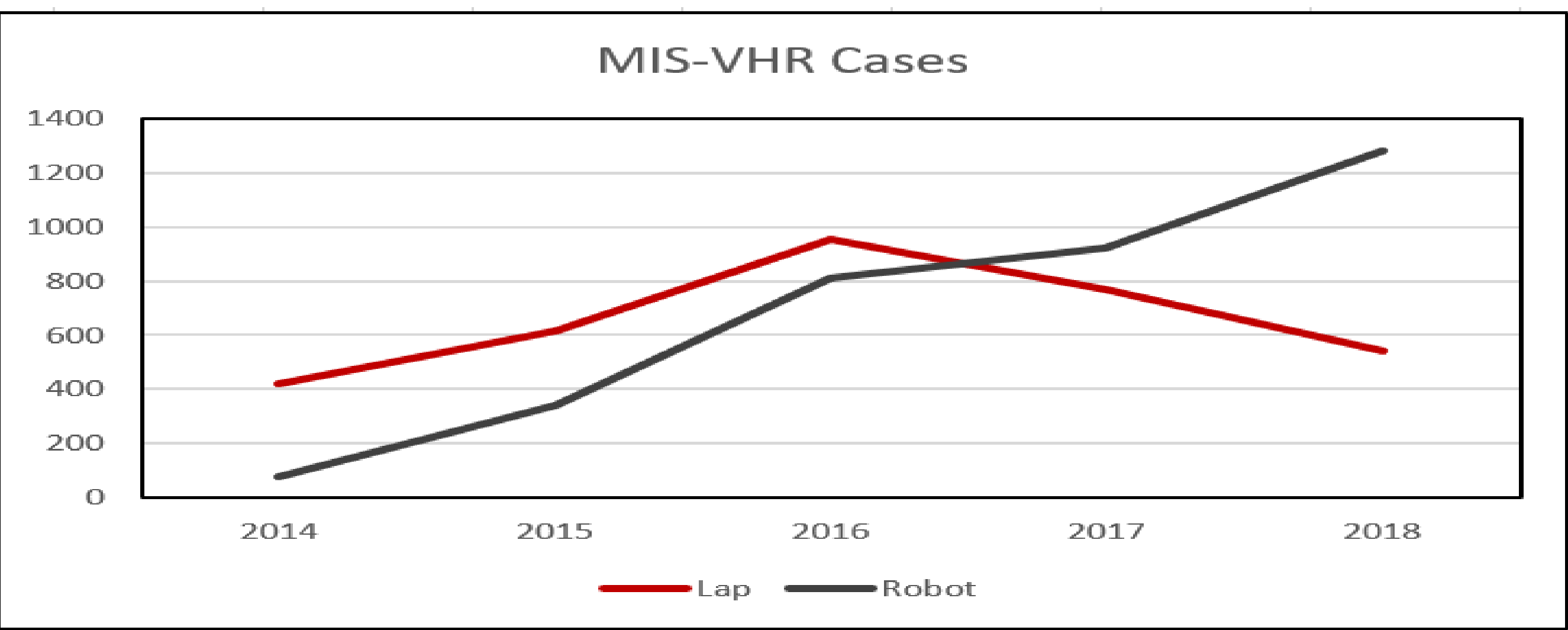


Figure 2: MIS-VHR Cases Over Time



Results (Continued)

The rates of SSO's were significantly different between open cut down (4.99%), veress (6.83%), and optical trocar (10.58%), ($p < 0.001$).

The rates of SSO's decreased over the 5 year span with open cut down (12.28% - 3.08%), veress (14.8% - 5.78%), and optical trocar entry (18.9% - 10.3%) (Figure 1a). The largest drop occurred with robotic MIS-VHR (Figure 1b). In this same time period we saw an uptick in robotic MIS-VHR (Figure 2).

Logistic regression showed that for every prior hernia repair, SSOs increased by a factor of 1.2 (OR 1.2 CI 1.01 - 1.42) and SSIs increased by a factor of 1.5 (OR 1.5 CI 1.12 - 2.06).

Prior component separation increased SSIs by a factor of 3.35 (OR 3.35 CI 1.28 – 8.79).

Optical trocar entry compared to veress increased SSOs by a factor of 1.6 (OR 1.6 CI 1.06 – 2.32).

Discussion

While no access related injuries occurred with open cut down techniques through 804 MIS-VHRs, all three techniques had extremely low rates of access related injury. Despite having over 6000 cases we were not powered adequately to detect statistical differences with a 0.04% event rate.

However, optical trocar entry for MIS-VHR does appear inferior when considering SSO rates, especially in patients with prior ventral hernia repairs.

The rapid rise in robot MIS-VHRs along with the decrease in SSO's rates may suggest a learning curve with these newer MIS-VHR techniques. However, no statistically significant differences were seen between laparoscopic and robotic techniques. Prospective studies may be needed to identify the 'true' rates of complications as surgeons develop additional competency with novel MIS-VHR techniques.

Additionally, larger studies powered to detect these extremely low rate access related complications are needed to help develop consensus on the optimal technique for peritoneal access.